

Undergraduate Research Seminar  
Wednesday, September 4th 5:30 p.m.  
Leigh 309

### **Amir Nasajpour**

“Benzotriazole-Mediated Synthesis of Symmetrical and Unsymmetrical Bis 2-5-Diketopiperazines”

Diketopiperazines have attracted the attention of chemists for decades due to their unique characteristics that make them attractive scaffolds for drug discovery. These cyclic dipeptides have proven to be important building blocks showing significant biological activities including: antibiotic, antimetabolic, and anti-HIV. Although numerous accounts of diketopiperazines have been reported, bis-diketopiperazines have been recognized as difficult targets in previous studies, and few have been reported. We aimed to develop a new, versatile, and flexible strategy for the synthesis of bis-2,5-diketopiperazines (bis-DKPs), using open chain peptidoyl benzotriazole sequences which were converted into either corresponding symmetrical or unsymmetrical bis-DKPs in the presence of triethylamine utilizing proline as a turn-introducer. According to straightforward, macrolactamization strategies, our results yielded novel bis-DKPs in moderate to good yields with shorter procedure times.

### **Katelyn Bobek**

“Identifying Cardiolipin Oxidation Products by Matrix-Assisted Laser Desorption/Ionization Tandem Mass Spectrometry”

Cardiolipin (CL), gaining its name after first being discovered in animal heart tissue, is a phospholipid found mainly in the inner mitochondrial membrane of mammalian cells. Due to its unsaturated structure with four fatty acid substituents, it is prone to extensive fragmentation resulting from oxidation. This type of oxidative stress has been associated with various human diseases yet the biological activities and pathologies are relatively unknown. In this study matrix-assisted laser desorption/ionization mass spectrometry (MALDI MS) was used to identify tetralinoleoyl-cardiolipin (TLCL) modifications induced by in vitro oxidation under ambient light and air. Fragmentation pathways of both long chain and short chain oxidation products of TLCL were characterized using tandem mass spectrometry in negative mode. In order to gain a comprehensive understanding of Cardiolipin's role in disease the oxidation products must first be identified and understood.